P. 59, line 14, for 'distortional' substitute 'condensational.'

P. 296, in the two expressions for $\psi$, given in equation (17), insert 'tan $i$' before '$\frac{(\mu^2-1)^2}{\mu^2+1}$;' also in the expression for 'tan $e$' and 'tan $e_1$,' of equation (20), insert 'tan $i$' before '$\frac{(\mu^2-1)^2}{\mu^2+1}$.' The formula from which these expressions are deduced is correctly given at the foot of p. 295.

P. 296, in line 13 from top of the page, and in the left-hand members of equations (20) and (21), for '$w$' and '$w_1$,' read '$\omega$' and '$\omega_1$' respectively.

WILLIAM THOMSON.

The university, Glasgow, March 26.

**The cold weather of February and March.**

During the past two months the cold weather has been of unusually long duration; so much so, that in many places in and about the city the water and gas pipes, which are placed about four feet under the ground, have been frozen. This being the case, I have thought that it would be interesting to see, from the records of Draper's continuous self-recording thermometer of this observatory, what was the difference in the duration of the cold in this year, as compared with last. The following table shows the comparison of temperature every ten degrees, from the lowest to the highest, for the years 1884 and 1885, during the months of February and March, and also the number of times or hours the temperature was below or above 30°, which has been taken as a temperature of neither freezing nor thawing.

| Degrees. | 1884. Hours' duration. | | 1885. Hours' duration. | |
|---|---|---|---|---|
| | February. | March. | February. | March. |
| −10 to 0 | – | – | 2 | – |
| 0 to 10 | 14 | 11 | 44 | 5 |
| 10 to 20 | 30 | 71 | 191 | 139 |
| 20 to 30 | 97 | 105 | 250 | 157 |
| Hours of cold | 141 | 187 | 487 | 301 |
| 30 to 40 | 375 | 223 | 155 | 362 |
| 40 to 50 | 152 | 225 | 30 | 62 |
| 50 to 60 | 28 | 102 | – | 19 |
| 60 to 70 | – | 7 | – | – |
| Hours of heat | 555 | 557 | 185 | 443 |

| | | |
|---|---|---|
| Hours of cold, in 1885, for February | 487 | |
| Hours of cold, in 1885, for March | 301 | 788 |
| Hours of cold, in 1884, for February | 141 | |
| Hours of cold, in 1884, for March | 187 | 328 |
| Difference of hours of cold between the two years | | 460 |

There were therefore, during these two months, 460 hours more of cold in 1885 than in 1884.

DANIEL DRAPER, PH.D.,
*Director.*

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## *CIVIL AND ASTRONOMICAL TIME.*

THERE seems to be a good deal of doubt whether the recommendations of the Prime-meridian conference are going to be very generally accepted. France, and the nations under French influence, certainly will not adopt the new anti-Greenwich meridian for many years, if ever. The matter is really one of comparatively little importance; that is to say, it will make no very great practical difference to any one if different nations continue to use different meridians: still there can be no question that there would be a real and considerable convenience in the establishment of a single meridian, and consequently of a time-system, which, like our present railroad-time in the United States, would be identical as to minutes and seconds all over the earth. It is probable that the gentle pressure of this convenience will, after a while, bring about the desirable concurrence, especially as the increasing extent and rapidity of travel and communication will all the time bring out more forcibly the inconveniences of the present state of affairs, and tend to weaken mere local feeling and prejudice, which, after all, is the main obstacle at present to the universal adoption of the meridian proposed.

The recommendation that astronomers should come into agreement with other folks, and begin their day at midnight instead of the following noon, as at present, seems especially likely to fail. The Greenwich observatory, indeed, adopted the new plan on Jan. 1; but, so far as we know, no other important astronomical establishment has yet done so. Commodore Franklin, of the U. S. naval observatory, proposed to follow the example of Greenwich, and issued an order to that effect; but it excited so much opposition from certain eminent and influential astronomers, that the order was suspended before the time came for it to go into operation.

The objections of Professor Newcomb, who has formulated more fully and forcibly than any one else the reasons why the change should not be made, relate not so much to the fact that astronomers would find it inconvenient to change the date of their observations at midnight, as to the confusion that would be likely to result in the combination and comparison of observations taken before the introduc-

tion of the new system, and after it. The same sort of difficulty now exists in comparing observations made before and after the introduction of the Gregorian calendar; but in this case the discontinuity amounts to ten or eleven days, and cannot escape notice, while the discontinuity involved in the proposed system would be only twelve hours, and might easily be overlooked with most damaging consequences. This objection is undoubtedly valid and weighty. The other objections urged, as to changes needed in the ephemerides, really amount to very little. At present, one has to stop a moment to consider whether he is acting as a *civilian* or an *astronomer* when he opens the Ephemeris to look out data; and it is quite immaterial as regards the numbers given for *noon*, for instance, whether noon is called 0 h. or 12 h. As to the changes in the printing of the Ephemeris, they would involve a little extra work the first year, but nothing of any consequence.

*Per contra*, a considerable majority of the astronomers consulted by Commodore Franklin were of opinion that the advantage gained by abolishing the distinction between civil and astronomical reckoning would fully compensate for the admitted annoyance consequent upon the change. The number of people inconvenienced by the change would be very small, and they would be persons abundantly able to guard against mistakes such as others would be likely to make. On the other hand, the present system leads to confusion in the case of all neophytes in astronomical work: indeed, pretty good astronomers are sometimes caught napping when they look into the almanac for forenoon data; and in publishing observations it is often necessary, and always wise, to state whether civil or astronomical reckoning is used. Of course, the change in itself considered is of very little importance; but it does seem rather unfortunate that the recommendations of the Washington conference should fail, to begin with, at the Washington observatory, and the effect will undoubtedly be to postpone the acceptance of the whole system of proposed reforms.

## *THE SCIENTIFIC RESULTS OF THE LADY FRANKLIN BAY EXPEDITION.*[1]

THE general interest in the scientific work of most polar expeditions has been seriously affected by the long delay which necessarily occurs in the publication of the records and results. With the permission and concurrence of Gen. W. B. Hazen, chief signal-officer, I take pleasure in giving, as far as I can at present, a brief summary of some of the scientific results of the Lady Franklin Bay expedition.

Hourly magnetic declination observations for thirty-two days on which they were made previous to July 1, 1882, were reduced at Fort Conger. The mean declination thus obtained was 100° 12′ west, being 1° 32′ less than the result deduced from the observations of the English expedition of 1875–76. The maximum easterly deflection occurred at 2 A.M., local time (7 A.M., Gottingen mean time), and the maximum westerly deflection at 12 M. A primary maximum at 4 P.M., most probably was due to disturbances. These deflections are from one to two hours later than those obtained from the observations of Lieuts. Archer and Fulford, R.N., in 1875–76; but it is possible that the observations for the complete year, which are now in the hands of Assistant Charles Schott of the U. S. coast and geodetic survey for reduction, may give other results. The hours, however, agree with those determined for Van Rensselaer harbor by Mr. Schott, in the discussion of Kane's observations. The absolute range of the English observations was 8°; and the greatest daily change, 5° 9.4′. From 8.35 A.M. (Gottingen mean time), Nov. 16, 1883, to 10.30 P.M., Nov. 18, the absolute range as observed was 20° 28.2′, — from 113° 19.8′ west, to 92° 51.6′ west. These times and figures are given as of more than common interest in connection with the great magnetic storm of November, 1883. The changes at Conger were much greater, it will be observed, than at Godthaab, Greenland, where, Paulsen says, on Nov. 17, 1883, from 2 A.M. until noon, the declination had varied 4° 44′ to the east, and later about 5° to the west; so that the variations for the day reached 9.5°.

The following table of monthly means has

[1] The accompanying picture represents Fort Conger as it was photographed by Sergeant George W. Rice, in March, 1882, the print from which it was taken being one of the few that were brought safely home by the Greely party. The high ground at the north-west of the station is seen at the left. The picture represents the principal building occupied. There were three other small structures, astronomical and magnetic observatories, and an instrument-shelter, the wires seen at the right running to the astronomical observatory.